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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,102	01/20/2004	Kazuya Miwa	101175-00045	6932

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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12/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,102	MIWA, KAZUYA	
	Examiner	Art Unit	
	Raymond Alejandro	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/759102.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/15/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This office action is responsive to the amendment filed 11/15/07. The applicant has overcome all the objections and the 35 USC 112 rejections. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments and remarks. However, the present claims (including newly added claims 12-14) are finally rejected over the same art as posited on the written record below:

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 11/15/07 was considered by the examiner.

Oath/Declaration

2. A copy of the previously filed declaration was submitted by the applicant to address the deficiency noted in the prior office action.

Drawings

3. The drawings were received on 11/15/07. These drawings are acceptable.

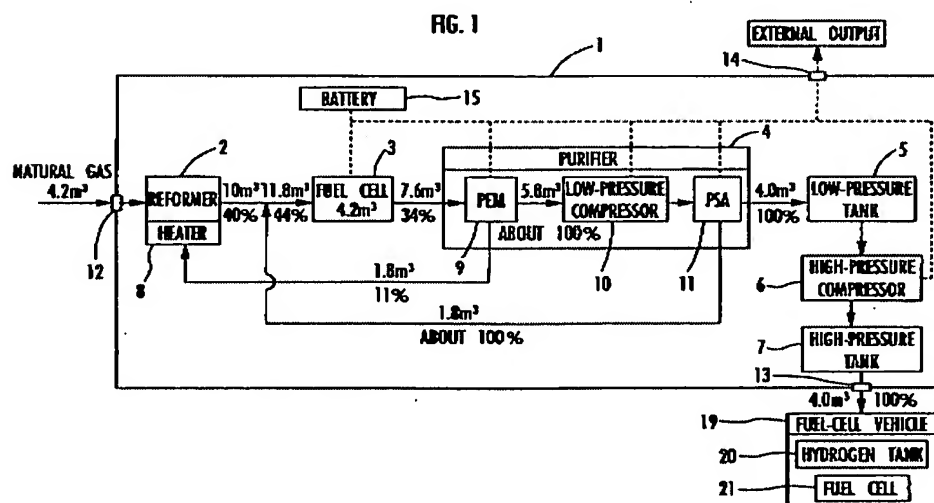
Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention including the claims. The added material which is not supported by the original disclosure is as follows: (claim 1) the recitation "*the exhaust gas is discharged only from the fuel cell*" is not supported by the as-filed application. For instance, applicant's **FIGURE 1** reproduced hereinbelow for applicant's convenience notably shows that applicant's purification means receives "exhaust gas discharged from the reformer 2", "exhaust gas discharged from the fuel cell 3", and "discharged gas from the PSA unit 11", and even within the purifier 4 there are other elements such as the PEM membrane separator 9, the low pressure compressor 10 and the PSA adsorber 11 generating discharge gas as well.



Therefore, the newly added limitation “*the exhaust gas is discharged only from the fuel cell*” is unsupported by the applicant’s specification in the context of both that “the discharge gas comes only from the fuel cell” (i.e. that all other units do not produce/generate a discharge gas) and/or that “applicant’s purifier 4 only receives discharge gas from the fuel cell as if the fuel cell and the purifier were fully isolated from the remaining fuel cell units” (in this second context please note that applicant’s purifier 4 indirectly receives gas from the reformer 2 and the PSA unit 11 (purifier 4 itself) upon recirculation)

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 6-10 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Keefer et al 2006/0182680.

The objective of the present invention is directed to a hydrogen supply unit wherein the disclosed inventive concept comprises the specific purification means.

With regard to claim 1:

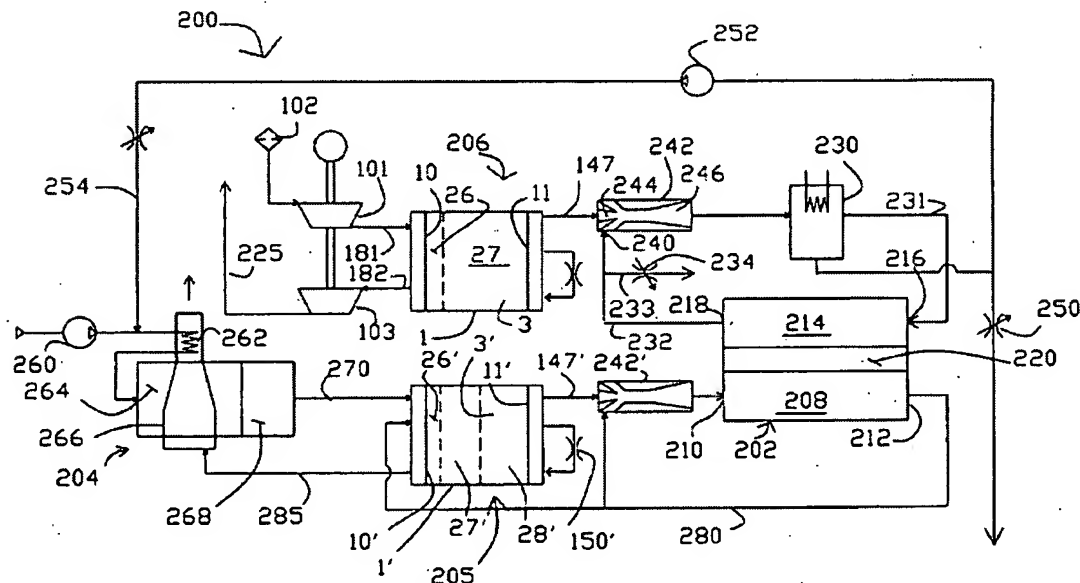
Keefer et al disclose a system and process for providing hydrogen to fuel cells (TITLE/Abstract) including a steam reforming fuel processor 204, a fuel cell 202, and a

hydrogen purification PSA system 205 (PSA stands for pressure swing adsorption)

(P0096/CLAIM 18). Reforming is used to generate hydrogen (P0004, 0103), and the fuel cell provides a source of electrical current (P0003). It is evident from **Figure 6** below that the hydrogen purification PSA system 205 is both upstream and downstream of the fuel cell 202 (See FIGURE 6). *Thus, it also receives the anode exhaust of the fuel cell.* **FIGURES 7-9** also depict other fuel cell power plant systems. Keefer et al disclose substitution or combined use of any type of hydrogen purification unit such as gas separation devices including other types of adsorption modules or gas membrane separation systems (P0095 & 0005).

(*Emphasis added*→) From FIGURE 6, it can appreciated that "exhaust gas" in line 280 only comes from the fuel cell (See FIGURE 6) as instantly claimed.

FIG. 6



With regard to claims 2-4:

Keefe et al disclose a hydrogen purification PSA system 205 (*PSA stands for pressure swing adsorption*) (P0096/CLAIM 18). Keefe et al further teach substitution or combined use of

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any type of hydrogen purification unit such as gas separation devices including other types of adsorption modules or gas membrane separation systems (P0095 & 0005). Ejector 242' (P0101) or even the conduit line (P0101) itself can act as the pressurizer.

With regard to claims 6 and 13:

The hydrogen purification PSA system 205 comprises plural zones and adsorbent materials for hydrogen purification (P0100 & 0103).

With regard to claims 7-8:

Keefer et al disclose using a steam reforming fuel processor 204 (P0096/CLAIM 18); or alternative fuel processors such as an autothermal or partial oxidation reactors for processing of hydrocarbon fuels to generate hydrogen rich reformat (P0103). Reforming is used to generate hydrogen (P0004, 0103), and the fuel cell provides a source of electrical current (P0003). *Steam and autothermal reforming encompass the use or transfer of heat.*

With regard to claims 9-10:

Keefer et al discuss purification and storage of hydrogen either as compressed gas or cryogenic liquid; and distribution of said hydrogen to a fuel cell vehicle (P0004).

Thus, the present claims are anticipated.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer et al 2006/0182680 as applied to claims 3-4 above, and further in view of Carr et al 4233132.

Keefer et al is applied, argued and incorporated herein the reasons expressed above. However, the preceding prior art reference does not expressly disclose the specific membrane separator.

Carr et al disclose an apparatus for producing (purifying) hydrogen comprising electrodes being separated by a material and means for imposing electrical potential across the electrode for generating hydrogen (ABSTRACT/CLAIM 13).

With these teaching, it would have been obvious to a person of ordinary skill in the pertinent art at the time the invention was made to incorporate the specific membrane separator of Carr et al into the fuel cell system of Keefer et al as Carr et al discloses that it is known to use the above hydrogen membrane separator for continuously producing a suitable quantity of hydrogen which is separately collected and usable in gaseous form. Thus, Carr et al's hydrogen purification/generating apparatus assists in the generation, production or purification of hydrogen.

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11. Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer et al 2006/0182680 as applied to claims 3-4 above, and further in view of Applicant's Admission of Prior Art (heretofore the AAPA) (*Applicant's specification, page 2, lines 1-8*).

Keefer et al is applied, argued and incorporated herein the reasons expressed above.

As to claims 11 and 14:

Keefer et al discuss purification and storage of hydrogen either as compressed gas or cryogenic liquid; and distribution of said hydrogen to a fuel cell vehicle (P0004). Ejector 242' (P0101) or even any of the conduit lines (P0101) itself can act as the pressurizer. *Keefer et al readily envisions hydrogen storage for use in a fuel cell vehicle.*

However, the preceding prior art reference does not expressly disclose the specific first tank for storing hydrogen.

The AAPA discloses that it is known to include a storage tank 35 for storing the hydrogen purified by the purifier 33 and the hydrogen which has not been used in the fuel cell (*Applicant's specification, page 2, lines 1-8*).

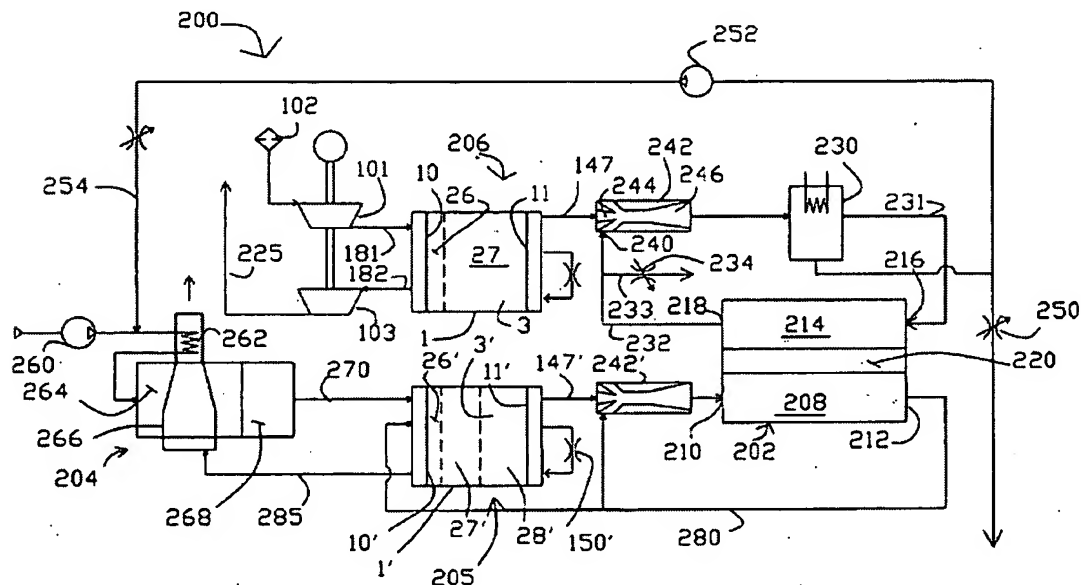
With these teaching, it would have been obvious to a person of ordinary skill in the pertinent art at the time the invention was made to incorporate the specific first tank for storing hydrogen of the AAPA into the fuel cell system of Keefer et al as the AAPA discloses that such a storage tank is useful for storing the hydrogen purified by the purifier and the hydrogen which has not been used in the fuel cell. Thus, the storing tank provides the benefit of storing hydrogen.

Response to Arguments

12. Applicant's arguments filed 11/15/07 have been fully considered but they are not persuasive.

13. Applicant's critical assertion to traverse the above ground(s) of rejection is based upon the contention that the prior art of record does not show the limitation "*wherein the exhaust gas is discharged only from the fuel cell*". The examiner largely disagrees with applicant's assertion. (*Emphasis added*→) From **FIGURE 6**, it can be appreciated that "exhaust gas" in line 280 only comes from the fuel cell as instantly claimed. Hence, Keefer et al's 680 purification PSA system 205 receives the exhaust gas containing hydrogen through line 280 which is discharged only from the fuel cell as instantly claimed (See FIGURE 6).

FIG. 6



Therefore, the Examiner sees no differences between the teachings and embodiment of Keefer et al'680 and applicant's invention within the context of the claimed language.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action (for claims 12-14). Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

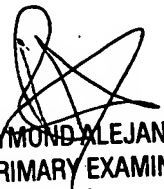
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro
Primary Examiner
Art Unit 1795



RAYMOND ALEJANDRO
PRIMARY EXAMINER